



Interior and Exterior of a Quadrilateral

A quadrilateral is a closed figure made of four line segments. It divides the plane into two parts:

1. Interior:

The inner region enclosed by the sides of the quadrilateral.

Any point inside the boundary is called an interior point.

2. Exterior:

The outer region that is outside the boundary of the quadrilateral.

Any point outside the sides is called an exterior point.

Example to Understand:

Imagine a square-shaped garden.

- The area inside the garden is its interior.
- The area outside the garden is its exterior.

Properties:0.....

- The interior of a quadrilateral is bounded by its four sides.
- The exterior is the unbounded region outside the quadrilateral.
- The sum of interior angles of any quadrilateral is 360° .
- The exterior angles of a quadrilateral are formed when sides are extended.

Note on Exterior Angles:

- An exterior angle of a quadrilateral is formed by extending one side at a vertex.
- Each exterior angle + its adjacent interior angle = 180° (They form a linear pair).

Example 1

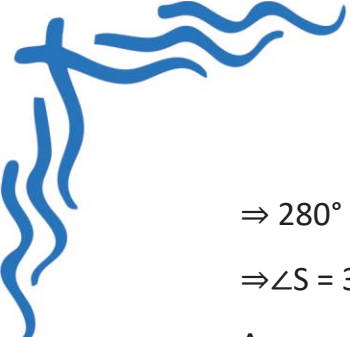
In quadrilateral PQRS, $\angle P = 110^\circ$, $\angle Q = 90^\circ$, $\angle R = 80^\circ$. Find $\angle S$.

Solution:

Sum of interior angles of a quadrilateral = 360°

Given: $\angle P + \angle Q + \angle R + \angle S = 360^\circ$

$110^\circ + 90^\circ + 80^\circ + \angle S = 360^\circ$


$$\Rightarrow 280^\circ + \angle S = 360^\circ$$

$$\Rightarrow \angle S = 360^\circ - 280^\circ = 80^\circ$$

Answer: $\angle S = 80^\circ$

Example 2

If one of the interior angles of a quadrilateral is 70° , what will be its exterior angle at the same vertex?

Solution:

$$\text{Exterior angle} + \text{Interior angle} = 180^\circ$$

$$\text{Given: Interior angle} = 70^\circ$$

$$\text{So, Exterior angle} = 180^\circ - 70^\circ = 110^\circ$$

Answer: Exterior angle = 110°

Summary Points

- The interior is the space inside the quadrilateral.
- The exterior is the space outside the quadrilateral.
- Interior angle + exterior angle at any vertex = 180° .
- The sum of all interior angles = 360° .
- Exterior angles help in understanding linear pairs and angle relationships.